

and others, very uninviting beyond all question, but doubtless including several accessible stations. Unfortunately there is now little time for preliminary survey during the Antarctic summer of 1873-74; but if such survey cannot be undertaken, then in the autumn (or Antarctic spring) of 1874, two or three ships (preferably steam ships) might proceed direct to the region indicated, each conveying two or three well-provided observing parties, and combining reconnaissance with the occupation of stations as they were successively selected.

That it is perfectly in the power of this country and America to ensure the requisite number of Southern observations of the coming transit, I am satisfied. There is, it is true, no time for delay. Energy and skill will be wanted; but they have never been looked for in vain in such circumstances. The expeditions which would have to be made would be no pleasure-parties, nor would they be free from difficulties and dangers sufficient to tax the courage even of British and American seamen. But these very considerations encourage the students of science in both countries to believe that the required effort will be made. That it should be made, if failure is to be averted, does not seem to me to be open to the slightest question.

List of Stations selected for Observation of the Transit of Venus by Russian Astronomers. By M. Otto Struve.

(Communicated by the Astronomer Royal.)

The following is a corrected list of stations for the observation of the Transit of *Venus*, as fixed at the General Meeting of the Russian Committee held on March 22, 1873:—

Station.	Latitude.	Longitude E. of Greenwich.	Instrument to be employed.	Proportion of Clear Sky in beginning of December. Per Cent.
1. Nakhodka	42° 48'	8° 51' 4"	6-in. refractor	80-85
2. Port Possiet	42° 40'	8° 43' 0"	Photoheliograph; 4-in. telescope	80-85
3. Hanka	45° 4'	8° 50' 0"	Heliometer	80-85
4. Busse	46° 24'	9° 15' 0"	3-in. telescope	unknown
5. Jeddo	35° 36'	9° 19' 0"	4-in. telescope	unknown
6. Pekin	39° 54'	7° 45' 7"	4-in. telescope	80
7. Habarowka	48° 16'	8° 58' 8"	3-in. telescope	80-85
8. Nertschinsk	51° 18'	7° 58' 5"	Heliometer; 4-in. telescope	70-80
9. Tschita	52° 1'	7° 34' 0"	4-in. telescope	90
10. Kiakhta	50° 20'	7° 6' 7"	Photoheliograph; 4-in. telescope	70-80
11. Blagoweschtschensk	50° 15'	8° 30' 5"	Heliometer; 4-in. telescope	80-85

1873 M.R.A.S. 33. 415S

Station.	Latitude.	Longitude E. of Greenwich. h m	Instrument to be employed.	Proportion of Clear Sky in beginning of December. Per Cent. below 50
12. Omsk	56° 30'	5 40' 3	3-in. telescope	
13. Taschkent	41 19	4 37' 3	6-in. refractor	60
14. Fort Perowski	44 51	4 21' 9	4-in. refractor	80
15. Fort Uralsk	51 11	3 26' 4	6-in. refractor	60
16. Orenburg	51 45	3 40' 5	3-in. telescope	below 50
17. Krasnowodsk	40 0	3 32' 0	Photoheliograph ; 4-in. telescope	70-80
18. Aschuradeh	36 54	3 35' 8	6-in. refractor	80-90
19. Naktritchevan	39 12	3 1' 6	4-in. refractor	90
20. Erivan	40 10	2 58' 1	6-in. telescope	90
21. Tiflis	41 42	2 59' 3	4-in. telescope	below 50
22. Jalta	44 30	2 16' 7	4-in. telescope	60
23. Kertch	45 21	2 25' 9	3-in. telescope	60
24. Kazan	55 47	3 16' 5	9-in. refractor	
25. Nicolaiew	46 58	2 7' 9	4-in. telescope	
26. Odessa	46 29	2 3' 0	6-in. refractor	
27. Kharkow	50 0	2 24' 9	4 in. refractor	

One station on the Russian territory will probably be occupied by American astronomers, namely,—

28. Wladiwostok	43° 7'	8 47' 7	American Photo- heliograph.	80-85
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The three stations for which the chances of clear sky are below 0.5, have been introduced for the reason that probably we shall have there good observers, engaged in other pursuits, whom we have only to provide with telescopes to enable them to make good contact observations, in case it should be clear. The same remark relates to the stations Jeddo, Pekin, and Busse. At the four fixed observatories, Kazan, Nicolaiew, Odessa, and Kharkow, the conditions are on the whole very unfavourable for the observation. Concerning the temperature to be expected at the time of transit, we have only the following estimations:—

Nakhodka, Possiet, Busse, Wladiwostok, Hanka				about 32° Fahrenheit,
Nertschinsk, Tschita, Blagoweschtschensk, Habarowka, Kiakhta	..	..	..	0
Pekin	..	..	..	32
Omsk	..	..	..	10
Taschkent	..	..	..	40
Uralsk, Perowski	..	..	..	25
Orenburg	..	..	..	20
Krasnowodsk, Aschuradeh	..	..	..	40
Naktritchevan, Erivan	..	..	..	50
Tiflis, Jalta, Kertch	..	..	..	45

At Nertschinsk and the other stations of Eastern Siberia the cold is rather strong, but, according to Professor Schwarz, who has spent ten years in those parts, that cold is commonly accompanied with a complete calm and dry air, and thereby it is not unpleasant for astronomical observations. With this conviction, Prof. Schwarz has selected for himself the station of greatest cold, Nertschinsk.

For nearly all the stations the observers are already designed, and will practise themselves this summer at Pulkowa in the use of their instruments. All the telescopes will have an equatoreal mounting; those designed as refractors are provided with clock-work and micrometrical apparatus for measuring the cusps, or the distances from the Sun's limb. Personal equations will be determined by help of an artificial transit apparatus.

The telegraphic longitude determinations through Siberia will be executed in the course of the next two years. The stations selected for that purpose comprehend several *Venus* stations, namely, Nertschinsk, Blagoweschtschensk, Habarowka, Wladivostok, and Taschkent. The other stations can be easily joined with these by chronometric operations. For the stations near the Caspian and Black Seas, the longitudes are already known with sufficient accuracy. All the observers will be provided with instruments for the determination of time and latitude.

Pulkowa, 1873, April 6.

Reply to the Remarks of Mr. Proctor upon the Position of the Lunar Atmosphere, when in a state of Equilibrium. By John J. Plummer, Esq.

(Communicated by the Rev. Professor Farrar, D.D.)

In discussing the possibility of our atmosphere enveloping that portion of the lunar surface remote from the Earth, which, being brought to the limb by libration, is the cause of the projection of stars within the lunar periphery, I had taken as a basis the investigations of M. Hansen, published in the *Memoirs of the Royal Astronomical Society*, vol. xxiv. If the correctness of those deductions be denied, my theory at once falls to the ground with them, but if, on the contrary, it be admitted, I can by no means concur in Mr. Proctor's argument. In the first place, I fail to find in M. Hansen's memoir any allusion to the irregular figure mentioned by Mr. Proctor, as representing that of the Moon on Hansen's supposition, nor am I clear upon what principles the centre of symmetry of such a mass would be found. It is true that M. Hansen considers it unlikely that the Moon is exactly spherical, yet he is careful to add, that it is quite possible